

# **Challenges of pandemic responsiveness on/of interactive space of tertiary educational institute: Lesson from public universities of Khulna**

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## **Abstract**

Like others, educational institutions have been shut down since 17<sup>th</sup> March 2020 after some cases tested positive for Covid-19. While the transmission rate slightly decreased, the government partially opened primary and secondary schooling; but reopening tertiary educational institutions was difficult. On the one hand, the students come from different areas of the country and gather and interact in the campus as part of learning. These knowledge-sharing spaces are vital for group study and enhance extracurricular quality. To this end, pandemic-responsive spaces are mandatory to ensure vibrancy and a quality learning environment on the university campus in any critical situation. The study aims to explore the behavioral patterns and attitudes of the students, followed by the spatial characteristics of cafeteria spaces. The exploratory approach takes a mixed stance for an in-depth understanding of the behavior and activity patterns. The questionnaire and observation are the primary methods used to obtain field data. The stratified sampling method was followed for 80 respondents for the questionnaire survey. The study results show that the university authority took some measures immediately, although students did not accept them over time. Secondly, a lack of concern and consideration is evident at the spatial level, although some students maintain pandemic-related health instructions. Thirdly, the finding suggests that space-focused analysis and behavioral studies are required to prepare pandemic-responsive spatial guidelines.

*Keywords: Covid-19; Interactive places; Tertiary education.*

## **1 Introduction**

The tertiary educational institution has the quality to enhance and facilitate a student learning environment through various outside spaces aside from classroom activities (Johnson & Lomas, 2005). Besides cognitive development, these provisions help increase students' social growth. Studies of these learning and gatherings are termed informal learning spaces. Informal learning space (ILS) plays a significant role in the tertiary educational institution, which falls outside the traditional classroom-oriented lectures. Many researchers attempted to outline the typology of ILS, such as the space outside of the classroom where students perform different activities. In reality, it is difficult to define the boundary between inside-outside or formal-informal spaces of an educational institution. Recent changes in information technology and subject-oriented paradigm shifts elaborate the informal learning role to achieve the mission of higher education. However, after Covid, the higher educational institute faced challenges managing these spaces according to pandemic-responsive guidelines.

To this end, recent studies elaborated on students' perceptions of the Covid-19 impacts on education. Highlighting the learning disruption and physical and mental health problems, these studies also identified stress, anxiety, and disappointment caused by online education, further pushing many life in danger.

Finally, the authority fixed the date to reopen face-to-face learning by following strong health guidelines. The university administrative body took numerous steps, such as providing quality masks to all staff and students, installation of hand wash facilities and awareness banners, and reducing tables from common spaces like the cafeteria. Along with the formal learning between students and lecturers, informal self-learning or informal gathering in open spaces are vital within the campus. Studying the learning environment in a tertiary educational institute explains the three approaches of learning instructional instruction, practical learning, and informal learning or self-learning are manifested by in the form of a lecture hall, laboratory space, and public space on campus Fisher (2005a, 2005b).

The study aims to explore the challenges of university interactive spaces to face the pandemic (Covid-19). The cafeteria of two public universities in Khulna has been taken as a case. The first section illustrates the study

design and the context; the second section depicts the findings and analysis, and the last section presents the discussion and conclusion.

## 2 Study design

The exploratory research approach is applicable to explore and interpret the issues that require in-depth analysis from various dimensions. The study deals with Covid-19 issues and the behavioral pattern of university students in gathering places within the educational institution. Following the severity of Covid-19 impacts, the tertiary educational institutions took numerous steps before reopening face-to-face learning. Various data collection and analysis techniques were used for an in-depth understanding of the phenomena. Figure-1 shows the overall study design process.

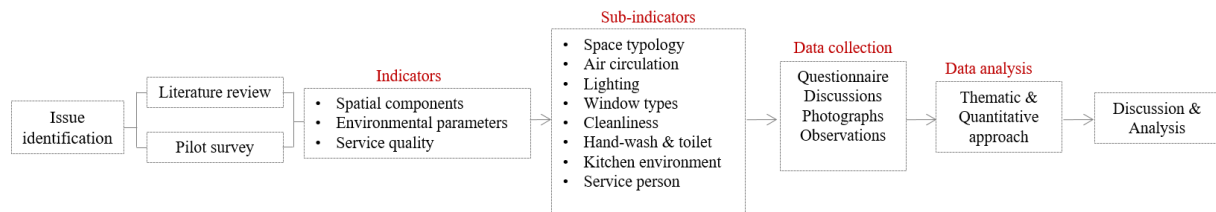


Figure 1: Study process details.

### 2.1 Sampling

Sampling is vital for this study for data types and reliability of the information. In total, 80 students have been selected from two universities. Following the stratified random sampling procedure, some factors, such as gender, year, time spent in the cafeteria, etc. considered. Students from different departments participated in questionnaires and discussion sessions.

### 2.2 Questionnaire

The purpose of the questionnaire survey was to explore students' experiences of participating in activities in cafeteria spaces during pre-covid and post-covid periods. Additionally, bring out the students' feedback on university authority initiatives regarding the Covid response and preferences of spatial characteristics. In total, 25 questions were asked to the students who actively used the cafeteria for different purposes. Moreover, the questionnaires were delivered and collected in person by providing an incentive (a clip file, pen, paper, pencil, and eraser) in the cafeteria.

### 2.3 Data analysis

The mixed approach uses for the analysis of the collected field data. The thematic method helps organize the discussions and descriptive data from the questionnaire survey. The SPSS was used for analyzing the quantitative data.

### 2.3 Study context:

At Khulna University (KU), there have many Informal Gathering Spaces (IGS) outside the class. Students gather in these spaces primarily for food and to hang out with friends. Along with the central cafeteria, 5 (five) small stalls facilitate the students (Figure 2). The cafeteria serves breakfast, lunch, and snacks to students and staff. There have separate sitting facilities for students and staff, a kitchen, a counter, and other service facilities. Indoor, semi-outdoor, and outdoor facilities have in each section, where the outdoors is the most vibrant space. A hand wash and toilet separately design adjacent to both zones.



students on the KUET campus. A small snack corner and a stationary shop are designed at ground level. The

Figure 2: The location of cafeteria, food stalls within and outside of campus.

cafeteria/canteen has separate indoor dining facilities for students and staff with hand wash and toilet facilities. A service counter, kitchen, and service person accommodations are included in the South-West portion (Figure).

### 3 Findings and Discussion

Table 1: The details of gathering space in and outside of the campus, and their character.

Scenarios of Khulna University			
Gathering location	Gathering time	Space character	Vulnerability level/index to pandemic (Covid)
	Purposes		
Cafeteria	Morning, Noon and Late afternoon	Indoor based with verandah around the indoor and adjacent open yard like space	Highly vulnerable due to inadequate hand wash and shabby indoor environment.
	Gossiping, food and study		
Foods stall within the campus	Morning to Night ( until 10 pm)	Semi-outdoor based food stalls with outdoor sitting (bench sitting)	Highly vulnerable for the absence of hand wash or hand sanitizer facilities. Even students do not maintain minimum distance.
	Foods, gossiping and rarely group study		
Open field, near monument	Morning, Noon and Late afternoon ( until 10 pm)	Outdoor based open space with minimum sitting or other facilities	Low vulnerability for its openness & healthy environment
	Gossiping and group study		
Outside of the campus	Morning to Night ( until 10 pm)	Indoor based sitting with minimum semi-outdoor/outdoor sitting	Lack social distancing for congested space & unhygienic quality increase the risk
	Foods and hang out		

Covid-19 has spread effects to the social, economic, and health sectors and severely disrupts the primary, secondary, and tertiary education system. The study findings highlighted the spatial challenges of tertiary educational institutions to make the gathering spaces responsive to pandemics like Covid-19.

The findings illustrate three indicators spatial characters, environmental features, and services (Figure 1).

#### 3.1 Spatial components

Scenarios of KUET			
Cafeteria	Morning, Noon and Late afternoon	Indoor based without semi-outdoor or outdoor	High vulnerability due to indoor based and unclean hand wash space
	Food, gossiping and study		
Outdoor spaces within campus	Morning, Noon and Late afternoon ( until 10 pm)	Outdoor based open space without any sitting	Low vulnerability for its openness & healthy environment
	Gossiping and playing		
Outside of the campus	Morning to Night ( until 10 pm)	Indoor-semi outdoor-outdoor based sitting	Lack social distancing for congested space & unhygienic quality increase the risk
	Foods and hang out		

The cafeteria is the most vibrant space on the campus and a common gathering space for all people of the university. Along with a place to hang out, it promotes students' learning from different dimensions. Survey findings from KUET and KU revealed that 50% of students preferred spending time in the cafeteria with friends and 23.8% at outside food stalls on the campus (Figure 3). Till now, no codes and guidelines have been declared focusing on Covid-19, although, based on the airborne nature of the virus compels us to maintain a 1.82 m (6') distance between face-to-face interactions. This recommendation is mandatory for all gathering spaces, particularly the dining space that has faced the hardest hit of the pandemic. The studies during the Covid time have indicated that the partitioned type spaces in dining were suitable for maintaining physical distance, and consumers also preferred these places for sitting (Taylor Jr 2020).

However, this space configuration ideology is difficult to maintain in cafeteria space in educational institutes for students' behavioral patterns. In the university cafeteria, the spatial arrangement is flexible, and students sit according to their preferences. The questionnaire and discussion during the field survey found that most students like group and circular sitting as these arrangements are convenient for hanging out and group working. They

come in a 3-4 person group and prefer circular or group sitting (Figure 4) . These types are available in the KU cafeteria, but long tables have been designed for the linear shape cafeteria space in the KUET. In total, 10-12 students or more can sit easily for different activities.

Gathering space	Frequency	Percent	Number of visit	Frequency	Percent
Cafeteria	40	50	Once a day	16	20.0
Outside campus	19	23.8	1-2 times	46	57.5
Food stalls inside campus	11	13.8	more than 2 times	16	20.0
Other	10	12.5	4	2	2.5
Total	80	100	Total	80	100

Figure 3: (Left) Student gathering percentage in different spaces; (Right) Number of visits in the cafeteria in a day.

Before the pandemic, 10-12 tables were seen in the KUET cafeteria where 100-120 students could sit at a time. After Covid-19, the authority reduces the table number to a 6' distance. But, in reality, it seems inadequate for facilitating a large number of students. As a result, students sit together without following the safest pandemic distance (figure 11). Similarly, due to the lack of space in the KU cafeteria, students sit very close together. In September 2020, the UN-HABITAT published detailed spatial guidelines for Covid-19 focusing on different scales at the city level. Based on the previous pandemic, on the micro (building) scale, there should have provisioned of standard lighting, ventilation, and sanitation facilities (UN-HABITAT, 2020). Additionally, design features that create a connection between indoor-outdoor should include ensuring human comfort during stress.

Number of person	Frequency	Percent	Sitting type	Frequency	Percent
1-2 person	20	25.0	Linear	4	5.0
3-4 person	37	46.2	Circular	37	46.3
More than 4 person	23	28.7	Group	39	48.8
Total	80	100	Total	80	100.0

Figure 4: (Left) Number of students come together at a time in the cafeteria; (Right) Student preference of sitting type.

The spatial analysis shows there has a sequence between indoor-semi outdoor-outdoor spaces (figure 5). Students use these spaces conveniently according to their preferences. A survey of the KU cafeteria revealed students spend most of their time sitting the semi-outdoor and outdoors instead of indoors. At the semi-outdoor, users organize the chairs according to their preferences where no table has been found. On the other hand, there have a few brick-made low-height walls in the outside space for sitting purposes. Recently some sitting facilities with tables have been designed adjacent to the outdoor portion to provide for the student's needs. After Covid, students most time sit outside spaces of the cafeteria. In a discussion, students from both universities mentioned having semi-outdoor and outdoor spaces for gathering. The students in the KUET suffer the most from the absence of semi-outdoor and outdoor spaces in the cafeteria. Some students stated the indoor becomes suffocated when the user number increased.

However, the sectional space analysis of the KUET cafeteria depicts an open space has been kept for occasional gathering near the indoor dining, but the corridor (circulation) separated spatial connectivity.

### 3.2 Environmental quality

The ventilation & air movement, lighting, and hygienic quality enhance the spatial resiliency to face any outbreak situation like Covid-19. Spatial studies focusing on informal housing elaborated that shortage of lighting, air movement, and unhygienic conditions directly affect Covid. For large gatherings in the hall or any other indoor space, these parameters are significant in controlling the Covid-19 virus transmissibility.

The KU cafeteria was established in early 1990. Along with small indoor spaces for students and university staff, verandah-like semi-outdoor also has been kept for sitting. Swing window with small pallas used at the west and south side for light and ventilation purposes. Initially, this provision was adequate for a healthy environment, but with time it becomes insufficient for ensuring a good quality indoor space. After the development of outdoor space adjacent to the verandah, the indoors became dark and damp. During reopening after Covid, the indoor environment is not safe for gathering for inadequate air movement. Further, the authority extended the outdoor space to an adjacent area with portable umbrella shading and a plastic chair table. However, during the survey, most students mentioned the opening is sufficient for lighting and ventilation, but the physical study found immediate up-gradation or reconstruction of all windows is required.

On the other hand, the KUET cafeteria is comparatively large and has spacious indoor space to accommodate students. Like KU, no semi-outdoor or outdoor dining spaces are kept adjacent to the indoor. The sliding window and high fixed opening are used for lighting and ventilation purposes, which is functionally inefficient to allow sufficient air movement to the space. Half of the sliding windows are closed, which impedes natural wind flow in indoor spaces.

### 3.3 Service facilities

The zoning of toilet and hand-wash facilities and the adequate numbers is vital. During Covid using hand sanitizer and face masks, time-to-time washing hands, and minimum social distancing were mandatory guidelines declared by WHO. During reopening after Covid, all public and private organizations or institutions were strongly directed by the regional and local monitoring committee to follow and take necessary steps regarding these guidelines. In the KU cafeteria, the hand wash basins located at the corner of the dining that did not follow proper zoning. Only two basins for hand washing and a toilet were provided, which was insufficient for the students. But, in the KUET, a dedicated space with a separate male-female zone is designed where the number of basins is considered. The cleanliness quality is not adequate for both cases. During the questionnaire survey, respondents mentioned inadequate soap/hand sanitizer in the hand washing zone.

In hygienic considerations, none of the service systems are in good condition. Food service providers are not very clean, and the foods are displayed in a filthy environment. The kitchen environment of the KUET cafeteria is comparatively better than the KU cafeteria. But massive changes are needed for the improvement of service quality.

## 4 Discussion and Conclusion

After Covid-19, two major challenges have been identified, firstly re-engaging the students again with studies after the stressful pandemic-induced closure for 17 months. Additionally, adopt the mixed/blended teaching approaches considering unequal access to the internet and associated conditions. Secondly, to manage the gathering spaces within the campus following the pandemic-related guidelines. Mainly, in accommodation (residential hall), dining space (cafeteria and student hall), and in the classroom, it is difficult to maintain the

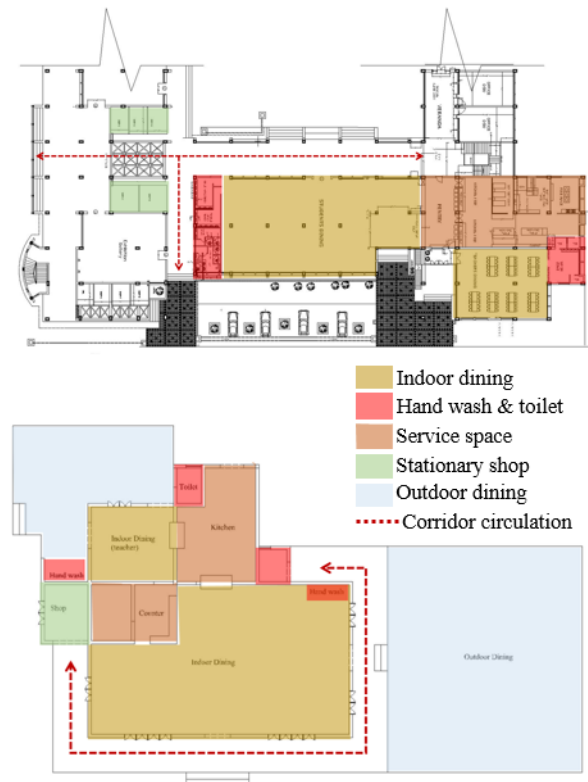


Figure 5: (Top) Spatial layout of KUET cafeteria;  
(Bottom) Spatial layout of KU cafeteria.

minimum distance. To consider these, the government provided different financial schemes for implementing Covid responsive components.

In KUET, the authority designed a portable hand wash facility that was given at each entry of every building. A dram with soap-water and freshwater separately kept on top, and 2-3 taps for hand washing. Most of these are placed outdoors without any shading (Figure 00). Most students claimed the lack of soap and water facilities makes it difficult to use. Moreover, cars and motor-cycle were kept adjacent to the hand wash, which impeded the circulation (Figure 6). The climatic and thermal comfort of the space are prerequisites to ensure a healthy environment. The damp environment within the KU cafeteria becomes unhealthy and risky as well. The KUET cafeteria, in this case, provides good quality but requires modification. The sliding window could replace by the swing type for adequate air circulation. For space management, different signage on the floor and, importantly, various table sizes can consider evident in many dining spaces during the new-normal time. The findings also revealed the students required diversified arrangements for flexible sittings. The discussions and physical observations found the semi-outdoor and outdoor spaces are the most vibrant in terms of activities. These spatial distributions are responsive to face any challenges, like Covid-19. The KUET cafeteria space needs to modify and add semi-outdoor space for better management of activities.



Figure 6: Cannot use the hand wash due to parking adjacent to the facility.

The service qualities for both cases are good. The hand-wash and toilet facilities need to increase for the KU cafeteria. The university authority recently started the construction of a Teacher-Student Center (TSC), where these provisions should include. For the KUET cafeteria, this zone requires updating with hand-wash and other elements. The toilets are not clean enough to use.

The cafeteria of the tertiary educational institute is a dynamic space where a variety of activities occur. Overall, making the interactive spaces of the University pandemic responsive requires an in-depth understanding of the behavioral patterns of users. The discussions and direct engagement of users could help to adopt and implement pandemic-responsive measures.

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